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### Prophylactic effect of Korean mistletoe (*Viscum album coloratum*) extract on tumor metastasis is mediated by enhancement of NK cell activity.

Yoon TJ, Yoo YC, Kang TB, Baek YJ, Huh CS, Song SK, Lee KH, Azuma I, Kim JB.

Animal Resources Research Center, College of Animal Husbandry, Kon-Kuk University, Seoul, Korea.

We here demonstrated the prophylactic effect of an extract (KM-110) from *Viscum album coloratum*, a Korean mistletoe, on tumor metastasis produced by highly metastatic tumor cells, colon 26-M3.1 carcinoma, B16-BL6 melanoma and L5178Y-ML25 lymphoma cells, using experimental models in mice. Intravenous (i.v.) administration of KM-110 (100 microg/mouse) 2 days before tumor inoculation significantly inhibited lung metastasis of B16-BL6 and colon 26-M3.1 cells, and liver and spleen metastasis of L5178Y-ML25 cells. The prophylactic effect of KM-110 on tumor metastasis was evident with various administration routes, i.e. subcutaneous, oral, intranasal as well as i.v., and was dependent upon the dose of KM-110 administered. Furthermore, mice given KM-110 (100 microg) 2 days before tumor inoculation showed significantly prolonged survival rates compared with the untreated mice. In a time course analysis of NK activity, i.v. administration of KM-110 (100 microg) significantly augmented NK cytotoxicity to Yac-a tumor cells from 1 to 3 days after KM-110 treatment. Furthermore, depletion NK cells by injection of rabbit anti-asialo GM1 serum completely abolished the inhibitory effect of KM-110 on lung metastasis of colon 26-M3.1 cells. These results suggest that KM-110 possesses immunopotentiating activity which enhances the host defense system against tumors, and that its prophylactic effect on tumor metastasis is mediated by NK cell activation.

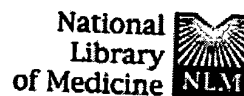
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☐ Korean mistletoe lectin-induced apoptosis in hepatocarcinoma cells is associated with inhibition of telomerase via mitochondrial controlled pathway independent of p53.  
Arch Pharm Res. 2002 Feb;25(1):93-101.  
PMID: 11885700 [PubMed - indexed for MEDLINE]

☐ 2: Park WB, Lyu SY, Kim JH, Choi SH, Chung HK, Ahn SH, Hong SY, Yoon TJ, Choi MJ.

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☐ Inhibition of tumor growth and metastasis by Korean mistletoe lectin is associated with apoptosis and antiangiogenesis.  
Cancer Biother Radiopharm. 2001 Oct;16(5):439-47.  
PMID: 11776761 [PubMed - indexed for MEDLINE]

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☐ cDNA cloning and sequence analysis of the lectin genes of the Korean mistletoe (*Viscum album coloratum*).  
Mol Cells. 2001 Oct 31;12(2):215-20.  
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☐ Activation of caspase cascades in Korean mistletoe (*Viscum album var. coloratum*) lectin-II-induced apoptosis of human myeloleukemic U937 cells.  
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☐ Gamma-interferon (IFN-gamma) augments apoptotic response to mistletoe lectin-II via upregulation of Fas/Fas L expression and caspase activation in human myeloid U937 cells.  
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
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
Activation of c-Jun N-terminal kinase 1 (JNK1) in mistletoe lectin II-induced apoptosis of human

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 Protein kinase A or C modulates the apoptosis induced by lectin II isolated from Korean mistletoe, Viscum album var. Coloratum, in the human leukemic HL-60 cells.  
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
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PMID: 10211936 [PubMed - indexed for MEDLINE]


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 Isolation and characterization of beta-galactoside specific lectin from Korean mistletoe (Viscum album var. coloratum) with lactose-BSA-sepharose 4B and changes of lectin conformation.  
Arch Pharm Res. 1998 Aug;21(4):429-35.  
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 Prophylactic effect of Korean mistletoe (Viscum album coloratum) extract on tumor metastasis is mediated by enhancement of NK cell activity.  
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**Isolation and characterization of beta-galactoside specific lectin from Korean mistletoe (*Viscum album* var. *coloratum*) with lactose-BSA-sepharose 4B and changes of lectin conformation.**

**Park WB, Ju YJ, Han SK.**

Faculty of Environmental and Life Science, Seoul Women's University, Korea.

Lectins and its A- and B-chains from Korean mistletoe (*Viscum album* var. *coloratum*) were isolated by affinity chromatography on the Sepharose 4B modified by lactose-BSA conjugate synthesized by reductive amination of ligand (lactose) to epsilon-amino groups of lysine residues of spacer (BSA) after reduction by NaCNBH<sub>3</sub>. The lactose-BSA conjugate was coupled to Sepharose 4B activated by cyanogen bromide. The molecular weight determined by SDS-PAGE were a 31 kD of A-chain and a 35 kD of B-chain. Amino acid analysis and N-terminal sequencing were performed. The effects of pH, temperature and guanidine chloride on the conformation of the lectin were investigated by measuring its intrinsic fluorescence and compared with its hemagglutinating activities. Blue shift was detected on the acidic pH and there was a close relationship between activities and conformation of the lectin. Under denaturing conditions, the tryptophan emission profile of lectin showed typical denaturational red shift which also correspond to the conformations and activity of lectin.

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